

Response Under 37 CFR 1.116
Expedited Procedure
Examining Group 1700
Application No. 10/820,994
Paper Dated: June 9, 2008
In Reply to USPTO Correspondence of April 7, 2008
Attorney Docket No. 1217-043819

REMARKS

The Final Office Action of April 7, 2008 has been reviewed and the comments therein carefully considered. The application has been amended. Applicants have amended the specification to correct minor typographical and/or translational errors. Specifically, claim 1 has been amended to incorporate the limitations previously appearing in claims 5 and 11 and claim 6 has been amended to incorporate the language of claim 11. Claims 5 and 11 have been cancelled. Applicants request entrance of these amendments because they put the claims in condition for allowance. Support for these amendments can be found in originally filed claims 5 and 11, and thus no new matter has been added. Consequently, claims 1-4, 6-10 and 12 are currently pending.

Claims 1-12 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Bishop et al., hereinafter "Bishop", (U.S. Pat. No. 6,284,309). Applicants respectfully traverse this rejection.

Bishop is directed to a method of producing a substrate, and more specifically to a method of preparing a substrate surface so that it is capable of forming a co-continuous bond. The method of Bishop includes the steps of obtaining a copper or copper alloy substrate and applying an etching composition thereto. The etching composition comprises an acid, an oxidizing agent, a copper complexing agent of either thiourea or imidazole-thiones and a copper complex present in an amount sufficient for it to precipitate when applied to the copper or copper alloy substrate.

The composition of Bishop is applied to the surface of a copper substrate to roughen the surface by creating a structure of interconnected channels and depressions so that an organic material, such as an adhesive, can flow within the channels and bond to the substrate. Each of the acid, oxidizing agent, complexing agent and copper complex components are essential to perform this function and thus essential to Bishop's composition. For example, the acid acts to etch the copper in the presence of the other ingredients to form micropores (col. 2, line 66 through col. 3, line 2), and the oxidizing agent act in conjunction with the other ingredients to promotes facilitation of the surface structure (col. 3, lines 43-46).

Response Under 37 CFR 1.116
Expedited Procedure
Examining Group 1700
Application No. 10/820,994
Paper Dated: June 9, 2008
In Reply to USPTO Correspondence of April 7, 2008
Attorney Docket No. 1217-043819

In the Final Office Action it is admitted that Bishop does not disclose a composition, like Applicants, that consists essentially of an organic sulfonic acid, thiourea, fluoroboric acid and hypophosphorous acid. It is then contended that one skilled in the art would find it obvious to modify Bishop's composition by removing the oxidizing agent therefrom and that this modification would result in Applicants' pre-treatment solution. However, Applicants submit that such a modification would not in fact be obvious in view of the teachings in Bishop.

As stated above, Bishop is directed to a method of imparting a surface structure onto a copper or copper alloy substrate. Bishop states that this structure is created by the components of the disclosed composition acting together, with the oxidizing agent promoting formation of the structure and the acid etching the copper "in the presence of the other ingredients" of the etching composition. Thus, removing the oxidizing agent and using it separately would not have been an obvious modification of Bishop. Instead, this would appear to go against the explicit teachings in Bishop of an etching composition of certain specific compounds acting in concert to create a copper substrate surface with a series of interconnected channels.

Furthermore, the disclosed uses and advantages of Bishop's etching composition are distinct from the Applicants' pretreatment solution and fail to provide any reasonable rationale for making the modification proposed in the Final Office Action. Applicants' solution removes residual copper, nickel and chromium which may remain on an insulating film without causing overetching of any previously formed wire pattern. On the other hand, Bishop only discloses an etching solution that, when applied to a copper substrate surface, forms a series of interconnected channels and micropores on the substrate surface making it easier to bond an organic material thereto. Nothing in Bishop discusses or teaches that the particular components of the etching composition could or should be modified in order to make the resulting composition suitable for other tasks in the metal-treating field.

In addition, Applicants have unexpectedly discovered that the use of such a solution improves the insulating resistance of the treated substrate. For example, as shown in Examples 1 and 2, a test piece having a comb-shaped pattern electrode that was immersed in

Response Under 37 CFR 1.116

Expedited Procedure

Examining Group 1700

Application No. 10/820,994

Paper Dated: June 9, 2008

In Reply to USPTO Correspondence of April 7, 2008

Attorney Docket No. 1217-043819

a solution according to Applicants' invention experienced no lowering of insulating resistance after constant voltage exposure for 1000 hours. To the contrary, as seen in Comparative Examples 1 and 2, test pieces which were not treated with the plating pretreatment solution exhibited a lowering of insulating resistance after the lapse of only 300 to 600 hours. One skilled in the art having read Bishop would in no way expect that a solution like that recited in the claims would create such advantageous properties. These surprising results provide further evidence that the claims are not in fact obvious over Bishop.

For all of the foregoing reasons, Applicants submit that claims 1-4, 6-10 and 12 are patentable over the cited documents of record and are in condition for allowance. Accordingly, entrance of the current amendment and allowance of pending claims 1-4, 6-10 and 12 are respectfully requested.

Respectfully submitted,

THE WEBB LAW FIRM

By 

Bryan P. Clark

Registration No.: 60,465

Attorney for Applicants

436 Seventh Avenue

700 Koppers Building

Pittsburgh, PA 15219

Telephone: (412) 471-8815

Facsimile: (412) 471-4094

E-mail: webblaw@webblaw.com